

1/27/05 Meeting Notes – Landfill Stability Workgroup
Raptor Conference Room – South Central Region Headquarters

website: <http://dnr.wi.gov/org/aw/wm/solid/landfill/stability/index.htm>

Attending: Sherren Clark (BT²), Bob Ham (UW), Gerard Hamblin (WMWI), Dan Leclaire (WMWI), Gene Mitchell (DNR), John Reindl (Dane County), Joe Van Rossum (UW-Extension/SHWEC), Brad Wolbert (DNR)

- I. General Items: Information was circulated regarding the UK's implementation of the European Union's waste directive, indicating that to meet the mandatory targets for reducing biodegradable waste sent to landfills, many localities will be relying on use of MSW incinerators and buying credits from localities that operate incinerators.

The group set its next 2 meetings for Wednesday, February 23, and Wednesday, April 6. Both meetings will run from 1:00 to 4:00, and will take place in the Raptor Room at the DNR's SCR Headquarters.

- II. Table of Stabilization Strategies: The group discussed the references in the diversion section to the percentages of the total waste stream represented by various organic waste types such as compostable paper and food waste. The consensus was to create a new column in the table and, for each stabilization strategy, fill in the percent of the waste stream that could potentially be addressed. DNR will draft this additional column using the 2002 Wisconsin waste sort, adding appropriate comments, and circulate it for the group to review. DNR will also provide additional information on the conversion technologies to clarify statements in the current draft regarding energy savings over landfilling.

The group also discussed the plan to post this table on the web site, and agreed that a prefatory statement is needed to explain the purpose and limitations of the table. DNR will draft this statement and circulate it for group members' review. The goal of the group is to finalize the table at the next meeting.

A longer term goal of the group is to develop and post a list of additional resources such as literature and websites that group members have found useful to the group's work.

- III. Measurement and Performance: The group discussed the following questions regarding how to determine when a landfill has reached stability, and how to measure whether the selected strategy is effective:

(1) **What parameters do we test for?** The group focused on carbon-oriented testing; ammonia is also a potential pollutant of interest, as are metals, though these generally are fairly immobile in the subsurface. Chlorides are another possible parameter, but appear less important as a potential pollutant.

(2) **What criteria should be used to judge success?** Two possibilities are a requirement to achieve a specific absolute level (x grams of carbon per cubic meter or per kilogram of waste), vs a percent reduction from initial levels.

(3) **What test method should be used?** The group discussed 3 ideas:

- measuring carbon flux and comparing to initial carbon loading in a site (mass balance);

- measuring levels of carbon in gas and establishing a threshold below which the site is considered “stabilized;” and
- sampling landfill material and analyzing for remaining degradable carbon.

The first two methods could be labeled *presumptive* methods and the third method *confirmatory*; one possible system would be to use presumptive methods until ready to spend additional money to prove stability has been reached via method 3. This expenditure might be justifiable if it has cost-savings consequences, e.g., a reduction in long-term care costs and required proof of financial responsibility.

Other points made during this discussion included:

- Ideally we’d have a system in which operator can assess progress against plan benchmarks and adjust operations through time if benchmarks are not being met.
- Using a gas production curve as a proxy for landfill impacts over time – the goal is to reduce the long tail of the curve to shorten the long-term care period. This may result from organics diversion lowering the entire curve, allowing the tail to dip below the allowable impact threshold earlier. However, if organics diversion simply moves impacts elsewhere (e.g., to a compost facility), the impacts of the materials management system haven’t truly been lowered, even if lowered at the landfill.
- It is very difficult to calculate the initial carbon loading into a landfill. Changes in the waste stream can drastically change initial loading as well as gas production, capture and destruction. Other sources of error in a carbon mass balance include fugitive emissions and errors in measuring gas flow rates.
- Wood is a problem material for measurement because the lignin, an organic material, doesn’t really degrade in anaerobic conditions, but if site ever goes aerobic in the future, it will degrade. This is a particular problem for demo sites. Newspapers pose the same problem in MSW sites.

The remainder of the discussion focused on presumptive actions (divert all decomposable organics or specify other actions, but don’t do physical tests) versus demonstrative measurements (mass balance or other measurable attributes to be compared to a standard).

- Even though we don’t have enough knowledge to predict how dry tombs will behave in 20 years, we lose too much time if we wait until this knowledge is established. We need to take reasonable steps now. We can take a presumptive approach, use milestones to check progress, and avoid using such measurements for enforcement.
- Given our lack of knowledge, even a plan might be asking too much—is the situation that urgent? There may be an advantage to starting small, say with leachate recirculation at selected sites. Plans shouldn’t force all landfills to start recirculating or bioreacting too much too fast. We may need to phase in the new requirements to avoid big problems.

- Could eliminate the plan if, for example, the group decides that a statewide ban on the landfilling of some organics is a better approach.
- There is no financial incentive to owners to achieve stability after 40 years since financial assurance is not tied to it. However, there might be a way to provide a financial incentive if stability is reached in a shorter period of time, say in 25 years. There may also be some non-financial incentives that could be provided for stability.
- Whatever approach we adopt, we need to ensure it:
 - establishes a level playing field
 - is flexible
 - is understandable
 - is implementable, and
 - is measurable.
- Shouldn't be a paper exercise. The fact is, it will have to be implemented at the landfill.
- Even though we don't have 40 years of data to know how bioreactors will behave in the long term, we think we know enough to say that enhanced degradation and/or organics diversion are steps toward where we want to go. We do know that operations like recirculation and capping have a huge influence on how sites behave.
- Support was expressed for a presumptive approach as long as we gather meaningful data along the way to improve the approach in the future.

The group's homework is to think more about what we would like to measure and why, and try to pull together a description of a prescriptive approach, at least for now. What things need to be monitored? Question of what the final evaluation criteria might be (for judging when to stop) is separate for now.